

### **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims:**

1-31. (Cancelled).

32. (Currently Amended) A ~~computer implemented~~ method, implemented by a server, for determining and presenting the likelihood a person has a mutated form of a gene, the method comprising:

receiving an electronic order from a clinician for at least one clinical agent ~~at least one of a clinical agent or a clinical event~~ for a person, wherein the electronic order does not indicate a request to ~~apply genetics to~~ use genetic techniques to characterize the person's response to the at least one clinical agent ~~at least one of the clinical agent or the clinical event~~ for the person;

in response to receiving the electronic order for the at least one clinical agent ~~at least one of the clinical agent or the clinical event~~, searching a table to determine whether the at least one clinical agent ~~at least one of the clinical agent or the clinical event~~ is associated with a gene, the table listing a plurality of genetic findings associated with a plurality of clinical agents and clinical events;

in response to the electronic order, querying a first database to determine if the person has one or more genetic test results for the gene;

in response to the electronic order, obtaining the mode of inheritance for the gene if the person does not have one or more genetic test results for the gene;

without solicitation from a clinician, querying a second database to determine whether at least one family member of the person within the mode of inheritance has one or more genetic test results for the gene;

utilizing the one or more genetic test results of the at least one family member to automatically calculate a likelihood the person has a mutated form of the gene if at least one of the family members has genetic test results for the gene; and

presenting the calculated likelihood the person has a mutated form of the gene to the clinician.

33. (Previously Presented) The method of claim 32, wherein the second database comprises an electronic medical record for each family member stored within a comprehensive healthcare system.

34. (Previously Presented) The method of claim 32, further comprising: inquiring whether at least one family member of the person within the mode of inheritance has one or more genetic markers related to the gene.

35. (Previously Presented) The method of claim 34, further comprising: utilizing the one or more genetic markers of at least one family member of the person to calculate the likelihood the person has a mutated form of the gene.

36. (Previously Presented) The method of claim 32, wherein the instructions for the method are embodied on one or more computer readable media.

37. (Previously Presented) The method of claim 32, further comprising:

determining whether the mutated form of the gene is a gene variant indicative of an atypical event.

38. (Previously Presented) The method of claim 37, wherein if the mutated form of the gene is a gene variant indicative of an atypical event, presenting an alert to a user.

39. (Previously Presented) The method of claim 32, wherein the mode of inheritance is selected from one of a mitochondria1 mode of inheritance, an x-linked mode of inheritance, a mendelian mode of inheritance, and a y-linked mode of inheritance.

40. (Previously Presented) The method of claim 32 wherein said first and second databases are the same database.

41. (Currently Amended) A computer system for determining and presenting the likelihood a person has a mutated form of a gene, the computer system comprising:

a server configured to execute:

- (1) a receiving module for receiving an electronic order for at least one clinical agent ~~at least one of a clinical agent or a clinical event~~ for a person from a clinician, wherein the electronic order does not indicate a request to ~~apply genetics to the~~ use genetic techniques to characterize the person's response to the at least one clinical agent ~~at least one of the clinical agent or the clinical event~~ for the person;
- (2) a determining module ~~for~~ for:

a) determining, in response to receiving the electronic order, whether the at least one clinical agent ~~at least one of the clinical agent or the clinical event~~ is associated with a gene, and

b) searching an inference table to determine a maximum distance away from the gene to search for genetic findings of linked genes for the person;

(3) a first querying module for querying, in response to the electronic order, a first database to determine if the person has one or more genetic test results for the gene if the at least one clinical agent ~~at least one of the clinical agent or the clinical event~~ is associated with one or more genetic test results;

(4) an obtaining module for obtaining, in response to the electronic order, the mode of inheritance for the gene if the person does not have one or more genetic test results for the gene;

(5) a second querying module for querying a second database to determine whether at least one family member of the person within the mode of inheritance has one or more genetic test results for the gene;

(6) a utilizing module for utilizing the one or more genetic test results of the at least one family member to automatically calculate a likelihood the person has a mutated form of the gene if at least one of the family members has genetic test results for the gene; and

(7) a presenting module for presenting the calculated likelihood the person has a mutated form of the gene to the clinician without solicitation from the clinician for the calculated likelihood.

42. (Previously Presented) The system of claim 41, wherein the second database comprises an electronic medical record for each family member stored within a comprehensive healthcare system.

43. (Previously Presented) The system of claim 41, wherein the second querying module determines the mode of inheritance has one or more genetic markers related to the gene.

44. (Previously Presented) The system of claim 43, wherein the utilizing module utilizing the one or more genetic markers of at least one family member of the person to calculate the likelihood the person has a mutated form of the gene.

45. (Previously Presented) The system of claim 41, wherein the first database comprises an electronic medical record for the person.

46. (Previously Presented) The system of claim 41, further comprising:  
a determining module for determining whether the mutated form of the gene is a gene variant indicative of an atypical event.

47. (Previously Presented) The system of claim 46, wherein if the mutated form of the gene is a gene variant indicative of an atypical event, the presenting module presents an alert to a user.

48. (Previously Presented) The system of claim 41, wherein the mode of inheritance is selected from one of a mitochondria1 mode of inheritance, an x-linked mode of inheritance, a mendelian mode of inheritance, and a y-linked mode of inheritance.

49. (Currently Amended) A method, implemented by a server, for determining and presenting the likelihood a person has a mutated form of a gene, the method comprising:

receiving from a clinician an order for a medication for a person, wherein the ~~clinician~~ order does not indicate a request to use genetic techniques to characterize the person's response to the medication ~~about the genetics of the person~~;

in response to receiving the clinician order for medication, determining whether the order for medication is associated with a genetic finding;

in response to the clinician order, querying a database to determine if the person has one or more genetic test results for a gene in response to the order for medication for a person;

in response to receiving the clinician order, obtaining the mode of inheritance for the gene if the person does not have one or more genetic test results for the gene;

without solicitation from the clinician, querying a second database to determine whether at least one family member of the person within the mode of inheritance has one or more genetic test results for the gene;

if the patient does not have the one or more genetic test results for the gene, automatically determining whether inferred results are allowed for the gene,

and if inferred results are allowed, automatically calculating an inferred finding that the patient has a mutated form of the gene based, in part, on one or more genetic findings associated with one or more family members of the patient and also based on a Quantitative Trait Loci (QTL) analysis of the one or more genetic findings associated with the one or more family members; and

outputting the inferred finding to a display for presentation in a user-readable format within a graphical user interface (GUI)

50. (Previously Presented) The method of claim 49, wherein the instructions for the method are embodied on one or more computer readable media.

51. (Previously Presented) The method of claim 49, further comprising:  
determining whether the mutated form of the gene is a gene variant indicative of an atypical event.

52. (Previously Presented) The method of claim 51, wherein if the mutated form of the gene is a gene variant indicative of an atypical event, presenting an alert to a user.